

SECRETARIAT OF THE UNITED NATIONS CONFERENCE ON
SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

ECONOMIC COMMISSION FOR LATIN AMERICA

Latin American Expert Meeting on Science and
Technology for Development

Mexico, D.F., 31 October - 2 November 1977

Information Document No. 1

PRELIMINARY GUIDELINES FOR THE PREPARATION OF NATIONAL PAPERS*

* Guidelines approved by the Governmental Technical Meeting of Central America and Panama on Science and Technology for Development (Guatemala, 10-14 October 1977). These guidelines attempt to extend and specify the orientations suggested by the Preparatory Committee for the United Nations Conference on Science and Technology for Development.

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1. Introduction

The purpose of this study is to investigate the effects of various factors on the growth of plants. The study was conducted in a greenhouse under controlled conditions. The factors studied were light intensity, temperature, and soil moisture. The results show that light intensity has a significant effect on the growth rate of the plants. Higher light intensity resulted in faster growth. Temperature also had an effect, with optimal growth occurring at a temperature of 20-25 degrees Celsius. Soil moisture was maintained at a constant level throughout the study.

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A. Contextual Factors

1. What is the prevailing development pattern?
(Economic dimension and structure, role of trade, external dependence, etc., taking into consideration the similarities of the countries of the Isthmus.)
2. Does technical progress stem on the whole from exogenous or endogenous sources?
(or: the role and weight of the external sector with regard to introduction and dissemination of innovations)
Indicators to measure technical progress, as the amount of royalties paid and a fitting classification of imports, should be established.
3. What are the national resources known and/or foreseeable?
4. What are the national objectives (within twenty years horizon)?
5. What are the medium-term national goals?
6. What are the distinctive features of public administration? of the universities? the private sector? with regard to use, application and financing of science and technology.

B. The Institutional Scheme

1. The real situation and import of science and technology within national development
2. The looked-for situation of science and technology within national development
With regard to both items an agreement on indicators is required, among which it could be mentioned the spending for science and technology, the magnitude of technical and scientific personnel, the evolution of the productive structure, the consequences of bilateral and multilateral arrangements, etc.
3. Is there an explicit and coherent policy for science and technology?
4. If so, who is responsible for it?
5. If so, what are its orientations?
6. To which extent does such policy contradict or complement the economic policy (fiscal, labour, industrial, agricultural)?

/7. What are

7. What are the national priorities in the field of science and technology?
8. How have they been chosen?
9. What and of which quality are the interministerial links with the academic centres, with the private sector, with international organisms?
10. The national expenditure on science and technology: magnitude, allocation, assessment of results
(These estimates have to consider qualitative aspects)
11. What are the principal actors of the national science and technology policy?
12. How are they related? what are the conflict patterns between them?

C. The Research System

Some aspects of this subject could be answered in qualitative terms. The subject should be elaborated in collaboration with the scientific community bearing in mind the requirements of each discipline.

1. Where does research and development (R&D) take place?
2. How is it financed?
3. What are the links between R&D and the users?
4. To which extent does R&D contribute to overcoming the technological dualism?
With respect to the following items 5 and 6 it has to be taken into consideration whether research is free or oriented, identifying in each case the institutions dedicated to one and another
5. What is the role of basic research?
6. Does R&D show a tendency towards specialization according to sectors or problems?
Each country will have to define clearly this concept
7. Does a critical mass exist within any area of R&D?
Note of the relators: there should be employed common concepts for defining these terms. It is suggested that internationally accepted glossaries, for example, the one elaborated for CACTAL, be used

/8. What is

8. What is the productivity of R&D in terms of publications, inventions?
9. Links between educational and research policies.

D. Human Resources

1. What is the situation and potential of the country's human resources in the field of science and technology? (Duly disaggregated)
2. Are there any conflicts between government and university?
3. Does educational policy supplement employment policy?
4. What are the prevailing orientations with regard to training at different levels (technical and scientific personnel)?
5. Are there tendencies towards specialization of human resources?
6. Brain drain: magnitude, origins, consequences.
(The research work on this subject carried out in the past should be updated, taking into consideration the recent studies made by UNCTAD)
7. Are there ~~attempts~~ attempts to repatriate scientists? (A critical analysis of this question is strongly recommended)
8. In which countries does the training of scientists take place?
Starting from which level?
Define if there is a policy in this regard and identify the criteria employed for the selection of the countries to which the nationals are sent for training purposes.

E. Links between Science and Technology and Economic Policy

1. What is the prevailing style of economic development?
2. What are the features and orientations of economic policy?
(Historical and prospective analysis is suggested)
3. What are the managerial and financial engines of growth?
(Role of the public and private sectors)
4. Does the economic policy give preference to local use of science and technology?
5. Inventiveness and local innovations: scope, impact, propagation
6. Which links are being established between productivity and technological learning?

/7. In which

7. In which sectors does foreign technology prevail?
8. How is the acquisition power of the public sector being used?
9. Does imported technology fit the local endowment of resources?
10. What is the relation between importation and local generation of technology?
11. What is the role of patents?
12. How is industrial information disseminated?
13. Are there national consulting and engineering firms and, if so, how efficient are they?
14. Foreign investment: nature, magnitude, regulations, results

F. Importation and Commercialization of Technology

1. Analyze the legislation on importation and commercialization of technology (its evolution, nature and scope)
2. Description of the different mechanisms for registering technological arrangements
3. Have analyses of the contents of contracts been made? (public and private)
4. If so, what were the results?
5. What are the prevailing attitudes among users with regards to importation and commercialization of technology?
6. What are the advances in the field of standardization?
7. What kind of technology is being imported?
To which degree had it been adopted?
8. Has the country started selling technology?
9. Destination? Terms?
10. Which modalities and mechanisms are followed with regard to acquisition of technology (in general and according to sectors)
11. How is importation of technology linked to the mechanisms of foreign investment?
12. Acquisition of technology by the public sector and disaggregation of technological packages
13. Cost benefit evaluation of importation and commercialization of technology: environmental impacts, irreversibility of some damages, cultural consequences and quality of life effects

/14. What

14. What are the ultimate consequences of the importation and commercialization of science and technology?

G. External Cooperation^{1/}

1. Precedents, scope, programmes
2. Are there institutionalized mechanisms for the assessment of the external cooperation?
3. What are the criteria for the acceptance of external cooperation?
(Establishment of indicators: technical, ideological and others)
4. Who determines them?
Centralization and autonomy in the handling of policies
5. What attempts are made to improve and diversify external cooperation?
6. Specific forms of external cooperation

H. The Identification of Areas

1. The links between national priorities and regional and subregional subject areas
2. Proposals for a World and Regional United Nations Programme in the Field of Science and Technology for Development

I. Bibliography

1. Texts and studies of UNESCO, OAS, UNCTAD and CEPAL
2. Anthology on science and technology policies compiled by SIECA
(3 volumes)
3. IDRC project on policies and instruments in 11 countries
4. Retrospective reading of El Trimestre Económico and Comercio Exterior
5. SIECA, Estudio de la Década, Vol. VI. BID/INTAL.

^{1/} International, regional and subregional, public and private.

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